

BODY ELECTRICAL

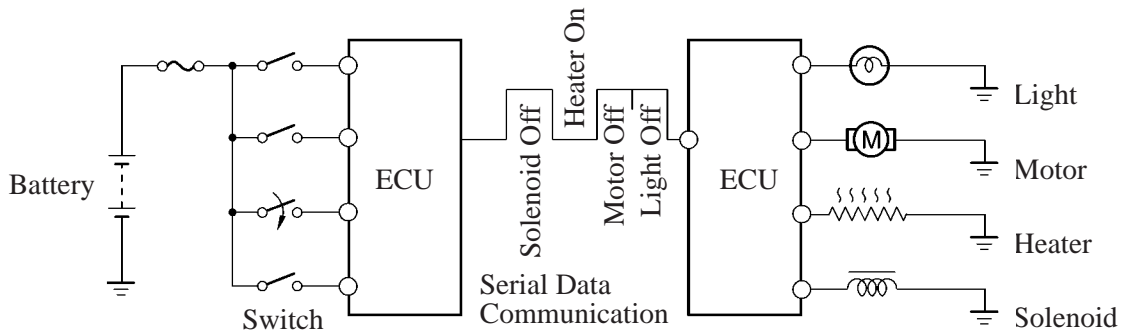
MULTIPLEX COMMUNICATION SYSTEM

DESCRIPTION

1. System Outline

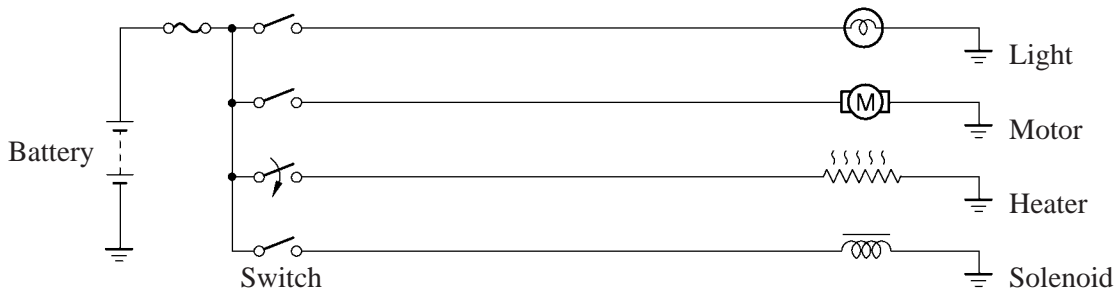
In the conventional system, electrical loads such as motors and lights were directly connected by wire harnesses to their switches which controlled their operation. However, in the multiplex communication system, the wire harness is replaced by serial data communication by the ECU, to provide functions similar to the conventional system, through a single serial communication bus. With this system, even when multiple tasks demand additional switches and electrical loads, communication among ECUs can be implemented through the serial communication bus only, resulting in a only reduction in wire harnesses. However, this system has also been adopted in the previous LS400.

► Conceptual Drawing of Multiplex Communication System ◀



Multiplex Communication System

189BE118



Conventional System

189BE119

2. Major Difference and Feature

The following changes have been made to the multiplex communication system of the new LS430.

- The multiplex communication system mainly consists of three BEAN (Body Electronics Area Network) systems: the instrument panel bus, the door bus, and steering column bus. The gateway function to connect the three buses is performed by the Gateway ECU. The increase in the communication volume, which results from the increase in the number of ECUs that support BEAN, is apportioned to three separate buses. This is to simplify the system and to prevent the other bus from being affected in case one bus fails.

Along with the increase in the number of ECUs that are connected, new DTCs (Diagnostic Trouble Codes) have been added. For details, refer to the LEXUS LS430 Repair Manual (Pub. No. RM792E).

- The communication between the control signals related to the audio and visual systems and the Gateway ECU is established via the AVC-LAN (Audio Visual Communication-Local Area Network). The transmission of the signals exchanged between BEAN and AVC-LAN is carried out by the gateway function of the Gateway ECU.
- A customized body electronics system, which improves the malfunction diagnostic function, enables the functions to be changed according to customer needs, and reduce the types of parts, has been adopted. The control master ECU for this system is the Gateway ECU.
- To protect the lighting system (turn signal lights, taillights, stoplights, and rear fog lights) in case the communication is disrupted due to a malfunction in the steering column bus, a backup bus is provided between the combination switch, driver side J/B ECU, and luggage room J/B ECU. In addition, a fail-safe line is provided between the front light ECU, combination switch, and passenger side J/B ECU in order to ensure the low-beam headlight and wiper HI operations.

► Major Difference ◀

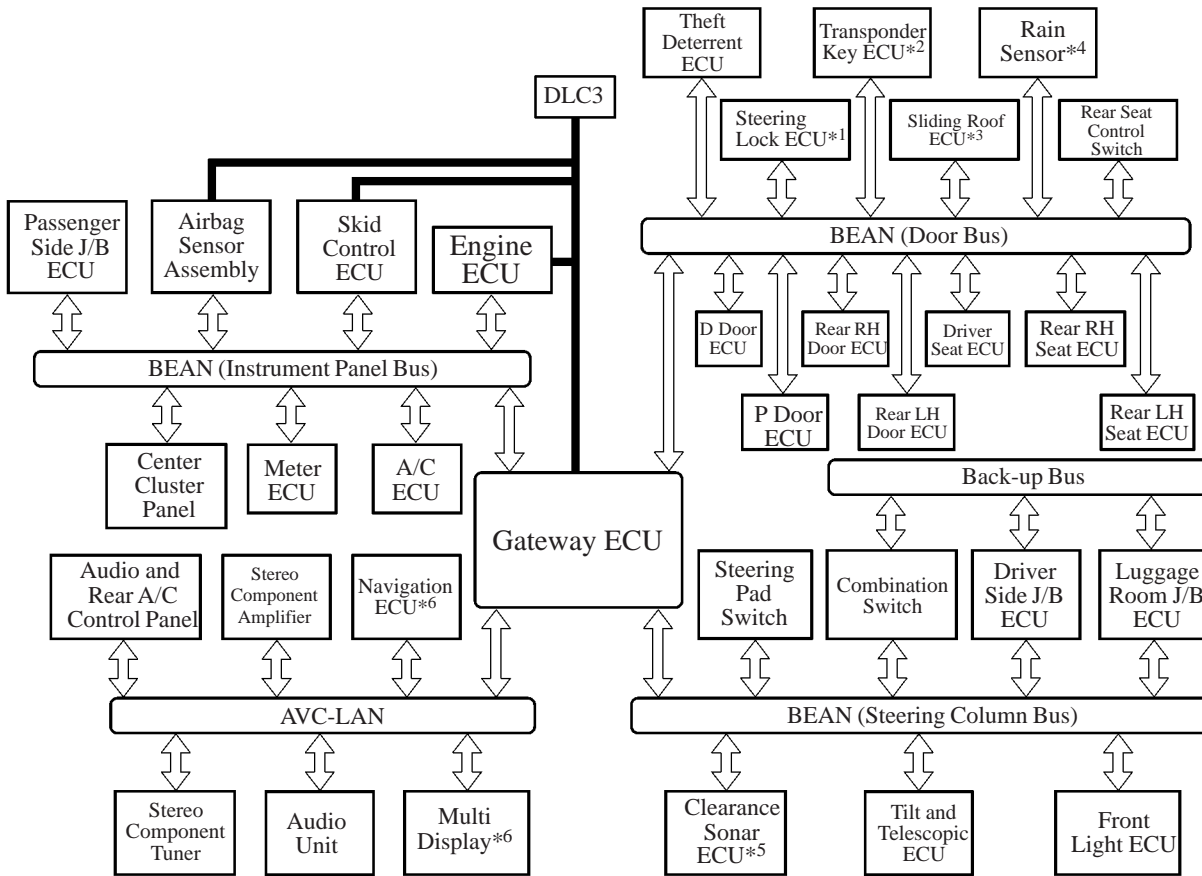
Item		New	Previous
Connected ECUs *1		28	12
Communication Frame *2		140	87
Gateway Function	BEAN × Diagnosis	Gateway ECU	Body ECU
	BEAN × AVC-LAN	Gateway ECU	Multi Display or Audio Unit
ECU in charge of vehicle information of the customized body electronics system		Gateway ECU	Body ECU
Troubleshooting the multiplex communication system		The DTCs (Diagnostic Trouble Codes) of the Gateway ECU are checked on the Lexus hand-held tester.	The DTCs (Diagnostic Trouble Codes) of the body ECU are checked on the Lexus hand-held tester.

*1: Optional ECUs are also included.

*2: A group of data that is required for a single instance of communication.

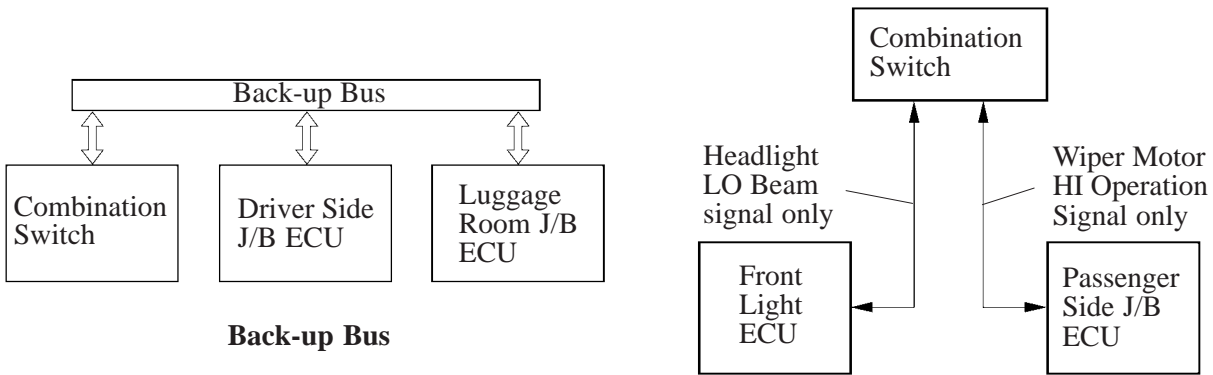
BE

► System Diagram ◀



189BE148

- *1: with Smart Key System
- *2: without Smart Key System
- *3: with Moon Roof
- *4: with Rain Sensor
- *5: with LEXUS Park Assist System
- *6: with Multi Display



189BE149

189BE150